Log.—L liquid: gl 1; fl 3; c palatal hard 2; b labial 2; d lingual 4. O short: a broad 1; ou 1; a short 2; o long 2; u short 68. G palatal: l liquid 2; d lingual 3; k palatal 4; v labio-dental 66.

Long.—L liquid: al 1; ar 1; gl 2; k palatal 1. O short: u short 1; e short 1; a medial 2; a short 3; a broad 5; o long 5. Ng: f labio-dental 1; l liquid 1; t dental 1; v labio-dental 1; g palatal 3; n liquid 7; th added 1.

Pod.—P labial: b labial 1; d lingual 2; c hard 5; f labio-dental 6; t aspirate 6; l liquid 7; h aspirate 171; no consonant before o once. O short: oo in hood 1; ou in pout 1; u long 3; o long 6; u short 7; a broad 7; a short 12. D lingual: g soft 1; f labio-dental 1; m liquid 2; th 3; p labial 3; b labial 4; ng 4; l liquid 5; v labio-dental 7; k palatal 13; t dental 17; g hard 132; open vowel 6.

Few.—F labio-dental: h aspirate 1; p labial 4. Ew: a long 1; o short 1; u short 2; i short 3; vowel sound preceded by l liquid 1, and by r 1; succeeded by g hard 1, by g soft 1, and by l 4.

Cat.—C palatal: h aspirate 1. A short: e short 1. T dental: p labial 1; ns 1; preceded by p 1, and succeeded by ch 1.

For courtesy extended by the teachers, whose routine work was somewhat interrupted, especial thanks are due, also to Dr. Merrill, head-master of the Boston Latin School, Mr. Pritchard of the Comins Grammar School, and the subordinates in all the schools entered; while the attention and ready obedience to directions of the pupils made the work a pleasure. Nothing could have been accomplished without the consent of the School Board, and the ready coöperation of that body is gratefully acknowledged.

As a matter of course, such tests lack mathematical accuracy, but great pains was taken, and much private practice made the pronunciation as nearly exact and even as it would be likely to be under any circumstances. The work was experimental, the path unbroken; better methods will undoubtedly be devised and more surprising results obtained.

One circumstance is not without suggestiveness. A child seven years old, with peculiarly abnormal development, was pronounced feeble-minded by examining physicians, but was retained in the kindergarten, where it received especial attention and made marked improvement. Dr. Blake kindly examined the child and found that early trouble with the inner ear had occasioned a period of deafness which had arrested mental development. The child is to be sent to the School for Deaf Mutes to learn the use of his vocal organs, instead of the School for Feeble-minded Children, the ear meanwhile to receive such treatment as the disorder indicates.

SARA E. WILTSE.

Sulla riproduzione degli Organi Gustatorii. LUIGI GRIFFINI. Rendiconti Rêale Istituto Lombardo, Ser. II, Vol. XX, 1887, pp. 667–683, 2 tavole.

Dr. Luigi Griffini, of Modena, has quite lately published (*Rendiconti del Reale Istituto Lombardo*, XX, 1887) an interesting memoir containing the results of his experimental study of the reproduction of the gustatory papillae and regeneration of the taste-bulbs in the rabbit and dog. It appears from his experiments that destruction (partial or complete) of the organs of taste is effected in two ways: first, by direct removal from the animal of the papillae themselves;

and secondly, by division of the glosso-pharyngeal nerves. After excision of the whole or a part of a papilla foliata of the rabbit, the area corresponding to the part removed becomes slightly depressed, and between the 5th and 8th day is revested with pavement epithelium. Later, from the 16th to the 20th day, a few small hemispherical elevations make their appearance, and these subsequently increase in size and number. During this period also many of the injured gland ducts undergo repair and become continuous with the free surface of the epithelium. Other ducts are found in the submucosa with their external opening closed, and greatly dilated by retained glandular secretion. The nuclei of the cells of the newly formed epithelium, both of the papilla and ducts, exhibit varied karyokinetic phases. Within the secondary papillary processes of the elevations above referred to, taste-bulbs, lying partly in the mucosa (and in process of formation), first make their appearance. Ten days after the complete excision of a papilla circumvallata of the dog, the area of removal is reclothed with epithelium, and the ducts communicate with the free surface. Twenty to thirty days later, a slightly raised and more or less rounded elevation of the mucosa is discernible, analogous to the reproduced elevations of the foliate organ. At the 40th day (in a single instance only) a few taste-bulbs, situated at the lateral margin of an elevation, were seen. The outer enclosing wall of the trench is not reproduced, the newly formed papilla having the characters of the fungiform type. Following section of the glosso-pharyngeals, the papillae are changed but slightly, but the taste-bulbs begin to degenerate within 23 hours. The taste-cells are first destroyed, disappearing completely by the 5th day; the supporting cells soon after undergo atrophy, and by the 28th day no bulbs are visible. At the 76th day after the division of the nerves, bulbs, in various stages of formation, were seen; but by the 209th day their development was still incomplete. Griffini rejects the theory of direct continuity between nerve-fibres and epithelial cells. He asserts that reproduction of the papillae after their partial or complete removal always takes place. The reproduction of the taste-bulbs, following the removal of a papilla or after section of the glosso-pharyngeal nerve, is effected in the following way: The axis cylinders of the divided nucleated nerve-fibres are regenerated and penetrate the epithelium; active prolification of the adjacent epithelial cells then occurs, the latter arranging themselves around the interepithelial nerve-fibrils and forming the supporting cells of the bulbs. This research of Griffini, although still incomplete, is a valuable contribution, not only to our knowledge of the taste organs, but also from its bearing upon certain histogenetic and morphological questions. The results attained by him, respecting the origin of the taste-bulbs, are in the main very different from those reached by such observers as Ranvier, v. Vintschgau and Hönigschmied. Griffini has likewise made a similar experimental study of the organ of smell, the motorial end-plate of the muscle-fibre, and the retina of the lower animals, the results of which have not yet, I believe, been published. F. TUCKERMAN.

Eine Vorrichtung zur Farbenmischung, zur Diagnose der Farbenblindheit und zur Untersuchung der Contrasterscheinungen. E. HERING. Pflüger's Archiv, Vol. 42, p. 119.

This plan of Hering's for color experiments has the merit of great simplicity. A dark room is provided with a rectangular hole in